

2. Devaraj, M. and Vivekanandan, E., *Curr. Sci.*, 1999, **76**, 314–332.
3. Vivekanandan, E., in Proceedings of the Fisheries for Nutritional Security (ed. Pandian, T. J.), National Academy of Agricultural Sciences, New Delhi and Madurai Kamaraj University, Madurai, 2000 (in press).
4. Chaudhuri, H. and Alikunhi, H., *Curr. Sci.*, 1957, **26**, 381–382.
5. Rao, P. V. and Kathirvel, M., *Indian J. Fish.*, 1973, **20**, 228–250.
6. Alagarswamy, K. and Qasim, S. Z., *Indian J. Fish.*, 1973, **20**, 533–550.
7. CMFRI Spl. Publ., 1978, **2**, p. 53.
8. Pajot, G. and Crockett, J., BOBP/WP, 1980, p. 23.
9. Garfield, E., *Curr. Contents*, 1979, **46**, 313–318.

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## Seismic wave amplification – Similarities between West Bengal (India) and Seattle (USA) basins

As detailed earlier<sup>1</sup> success of natural hazards and disaster management depends on a combined input from systematic scientific research, proper extensional education, organized training and involvement of common man.

As I was contemplating to formulate a comprehensive research programme for detailed seismic surveillance in the West Bengal basin, I came across an article in *EOS, Transactions of American Geophysical Union*<sup>2</sup>, with significantly similar but more detailed findings as in the case of the West Bengal basin<sup>3</sup>. The high resolution seismic refraction coverage in the Seattle basin, Washington (USA) has revealed that seismic shots in Seattle even though small (180 kg or less), were much more energetic than expected and were felt by Seattle residents as far as 4.5 km from shot points. Similarly, in the case of the West Bengal basin a shot charge of only 125 kg during seismic refraction survey in 1988, has produced unexpectedly considerable surface vibrations, resulting in panic amongst Burdwan population. It is attributed that this energy propagation<sup>2</sup> could be both due to the well-coupled detonation of the explosions within the water table and trapping of the seismic energy by low-

velocity surficial units within the basin. It is further stated<sup>2</sup> that there is a strong correlation between the geometry of the basin filled with sediments and the amount of amplification of the seismic waves. It is stated<sup>2</sup> that the amplification results from either focusing associated with the entire basin, or resonances and trapping of the seismic energy within the specific layers in the basin, probably the uppermost lower velocity quaternary deposits, whose geometry may measure the geometry of the entire basin. The finding that the seismic wave amplification was confined to the Seattle basin and nothing unusual has been noticed in the surrounding Olympic mountains region could be ascribed to a major extent even to the West Bengal basin, but for the differences in the geometries of the two basins. The seismic refraction studies<sup>4</sup> confined to the adjacent crystalline part, near Beliator, produced no amplified signal, as in the case of shots closer to Burdwan.

In the West Bengal basin as detailed earlier<sup>3</sup>, in similar geologic terrain all the phenomena noticed in Seattle basin were observed. As in the case of Seattle<sup>2</sup>, determining the origin of the amplification of the seismic waves within the West Bengal basin needs to be taken up

as a priority research topic, as a part of detailed surveillance package that includes stress studies, three-dimensional tomographic imaging of the area in and around Burdwan and close seismic surveillance network to record even micro tremors of magnitude  $\geq 2$ .

These observations emphasize the need for a detailed study in the West Bengal basin as it is well established<sup>2</sup> that crustal faults and sedimentary basins could pose seismic hazards in regions like the Seattle basin.

1. Reddy, P. R., *Curr. Sci.*, 2000, **79**, 1045–1046.
2. Brocher, T. M. *et al.*, *EOS Trans. Am. Geophys. Union*, 2000, **81**, 545–552.
3. Reddy, P. R., *Curr. Sci.*, 2000, **79**, 1144–1145.
4. Kaila, K. L., Reddy, P. R., Mall, D. M., Venkateswarlu, N., Krishna, V. G. and Prasad, A. S. S. R. S., *Geophys. J. Int.*, 1992, 45–66.

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